

**TOWN OF SHREWSBURY  
CONTRIBUTORY RETIREMENT SYSTEM**

Actuarial Valuation Report

January 1, 2008

## **TABLE OF CONTENTS**

	<u>Page</u>
<b>REPORT SUMMARY</b>	
Highlights	1
Introduction	2
Actuarial Experience	3
 <b>ACTUARIAL COSTS AND LIABILITIES</b>	
Normal Costs	4
Present Value of Actuarial Accrued Liabilities	5
Present Value of Future Benefits	6
 <b>FUNDED STATUS AND APPROPRIATIONS</b>	
Market Value of Plan Assets	7
Actuarial Value of Assets	8
Unfunded Actuarial Accrued Liabilities	9
Appropriations	10
Appropriation Forecast	11
GAS No. 25 and GAS No. 27	13
PERAC Annual Statement	14
 <b>EXHIBITS</b>	
1 Age/Service Distribution with Salary	16
2 Retiree Distribution	17
3 Disabled Retiree Distribution	18
4 Distribution Forecast	19
5 Summary of Plan Provisions	20
6 Actuarial Methods and Assumptions	27
7 Glossary of Terms	31
 <b>CERTIFICATION</b>	33
 <b>BREAKOUTS</b>	34

## Report Summary:

<u>Highlights</u>	<u>January 1, 2006</u>	<u>January 1, 2008</u>
<u>Contributions</u>		
Funding Schedule FY 2009	\$3,119,214	\$3,119,214
Funding Schedule FY 2010	3,231,124	3,033,129
<u>Funded Ratios</u>		
GAS No. 25	71.3%	77.0%
<u>Participants</u>		
Actives	615	648
Retirees and Beneficiaries	195	191
Vested	0	0
Inactives	137	112
Disabled	<u>30</u>	<u>30</u>
Total	977	981
<u>Payroll</u>		
Payroll of Active Members	\$19,896,839	\$22,402,987
Average Payroll	32,353	34,573
<u>Normal Cost</u>		
Employer	873,568	946,660
Employee	1,586,468	1,819,080
Administrative Expenses	<u>85,000</u>	<u>100,000</u>
Total	2,545,036	2,865,740
<u>Actuarial Accrued Liabilities</u>		
Actives	43,842,407	49,820,564
Retirees, Beneficiaries, Disabilities and Inactives	<u>31,538,190</u>	<u>35,436,128</u>
Total	75,979,303	85,256,692
<u>Actuarial Value of Assets</u>	<u>54,147,807</u>	<u>65,665,411</u>
<u>Unfunded Actuarial Accrued Liabilities</u>	\$21,831,496	\$19,591,281

## **Introduction**

This report presents the Town of Shrewsbury actuarial valuation findings as of January 1, 2008, under the Commonwealth of Massachusetts Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2008.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Town of Shrewsbury Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2008.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

### **Actuarial Experience**

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the preceding two years, the total unfunded actuarial accrued liability decreased by 10.3% to \$19,591,281. The decrease is the result of net favorable actuarial experience. The actuarial value of assets for 2006 and 2007 had returns of 8.63% and 11.26%, respectively. The sources of the (gain)/loss are as follows:

Investment	(1,691,701)
Salary	(1,302,488)
Retiree Mortality	416,206
Active Decrements (Termination)	(103,907)
Active Decrements (Disability)	153,724
Active Decrements (Retirement)	(1,106,820)
Active Decrements (Death)	(69,280)
New Entrants	945,065
Other (Data corrections, Section 3(8)(c), Service buybacks)	<u>129,400</u>
Total (gain)/loss	(2,620,801)

## Actuarial Costs and Liabilities:

### Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

**Table I**

	<u>January 1, 2006</u>	<u>January 1, 2008</u>
Superannuation	\$1,669,323	\$1,894,681
Termination	301,038	330,149
Death	134,744	148,712
Disability	354,931	392,198
Administrative Expenses	<u>85,000</u>	<u>100,000</u>
Total Normal Cost	2,545,036	2,865,740
% of Pay	12.8%	12.8%
Employee Contributions	1,586,468	1,819,080
% of Pay	8.0%	8.1%
Employer Normal Cost	\$958,568	\$1,046,660
% of Pay	4.8%	4.7%

## **Present Value of Actuarial Accrued Liabilities**

The actuarial accrued liabilities (AAL) represents today's value of all benefits based on the past service of the actives and inactive. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

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	<b>Table II</b>		
		<u>January 1, 2006</u>	<u>January 1, 2008</u>
Actives			
Superannuations		\$38,854,285	\$44,492,954
Termination		982,133	1,069,289
Death		1,505,024	1,686,664
Disability		2,500,965	2,571,657
Retirees and Inactives			
Retirees and Beneficiaries		24,686,905	26,844,562
Vested		0	0
Terminated (Refund)		598,706	690,548
Disabled		<u>6,851,285</u>	<u>7,901,018</u>
Total		\$75,979,303	\$85,256,692

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### **Present Value of Future Benefits**

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

**Table III**

	<u>January 1, 2006</u>	<u>January 1, 2008</u>
Actives		
Superannuation	\$54,136,722	\$61,635,965
Termination	2,287,054	2,516,800
Death	2,659,378	2,958,435
Disability	5,938,240	6,465,296
Retirees and Inactives		
Retirees and Beneficiaries	24,686,905	26,844,562
Vested	0	0
Terminated (Refund)	598,706	690,548
Disabled	<u>6,851,285</u>	<u>7,901,018</u>
Total	\$97,158,290	\$109,012,624



## Funded Status and Appropriations:

### Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

**Table IV**

	<u>January 1, 2006</u>	<u>January 1, 2008</u>
Cash equivalents	\$293,961	\$382,030
Short term investments	1,914,091	4,616,397
Fixed income securities	14,163,300	15,712,379
Equities	27,510,136	31,354,018
International	6,668,961	9,533,600
Real Estate	4,271,516	5,696,559
Venture Capital	0	0
Other	0	0
Accounts receivable	24,166	20,365
Accounts payable	(69,870)	(67,105)
Accrued income	<u>6,274</u>	<u>8,978</u>
Total Market Value	\$54,782,535	\$67,257,220
Total Actuarial Value	\$54,147,807	\$65,665,411

## **Actuarial Value of Assets**

The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.5%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 10%. The calculation of the actuarial value of assets as of January 1, 2008 is presented in Table V.

**Table V**

	<u>January 1, 2008</u>
(1) Market value at January 1, 2007	\$61,142,741
(2) 2007 Contributions	\$5,368,806
(3) 2007 Payments	(\$4,921,131)
(4) Net interest adjustment at 8.5% on (1), (2), and (3) to December 31, 2007	\$5,216,159
(5) Expected market value on January 1, 2008	\$66,806,575
(1) + (2) + (3) + (4)	
(6) Actual market value on January 1, 2008	\$67,257,220
(7) 2007 (Gain) / Loss	(\$450,645)
(8) 80% of 2007 (Gain) / Loss	(\$360,516)
(9) 2006 (Gain) / Loss	(\$1,927,585)
(10) 60% of 2006 (Gain) / Loss	(\$1,156,551)
(11) 2005 (Gain) / Loss	\$236,959
(12) 40% of 2005 (Gain) / Loss	\$94,783
(13) 2004 (Gain) / Loss	(\$847,628)
(14) 20% of 2004 (Gain) / Loss	(\$169,526)
(15) Actuarial value on January 1, 2008, (6) + (8) + (10) + (12) + (14) but not less than 90% nor greater than 110% of (6)	\$65,665,411
(16) Ratio of actuarial value to market value	97.63%
(17) Actuarial Value Return for 2006	8.63%
(18) Actuarial Value Return for 2007	11.26%
(19) Market Value Return for 2006	12.03%
(20) Market Value Return for 2007	9.23%

## **Unfunded Actuarial Accrued Liabilities**

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

**Table VI**

	<u>January 1, 2006</u>	<u>January 1, 2008</u>
Actuarial Accrued Liability	\$75,979,303	\$85,256,692
Actuarial Assets	<u>54,147,807</u>	<u>65,665,411</u>
Unfunded Actuarial Accrued Liability	\$21,831,496	\$19,591,281
Funded Status	71.3%	77.0%

## **Appropriations**

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2028, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the prior unfunded actuarial accrued liability by June 30, 2022  
\$ 22,212,082 over 14 years with 4.5% increasing payments
- Increasing amortization of the current (gains)/losses by June 30, 2022  
\$ -2,620,801 over 14 years with 4.5% increasing payments
- Interest adjustment for payments deposited at the beginning of the fiscal year for Light and Cable, August for the Town, and December for the Housing Authority.

The pension appropriation is shown in Table VII.

**Table VII**

	<u>January 1, 2006</u>	<u>January 1, 2008</u>
Normal cost	\$958,568	\$1,046,660
Amortization payment of the prior accrued liability	1,222,009	2,002,310
Amortization payment of current (gains)/losses	<u>559,644</u>	<u>(236,252)</u>
Total cost	\$2,740,221	\$2,812,718
% of Pay	13.8%	12.6%
Fiscal 2009 cost	\$3,119,214	\$3,119,214
Fiscal 2010 cost	\$3,231,124	\$3,033,129

### **Appropriation Forecast**

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2028 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be made at the beginning of the year.

The employer total cost is expected to increase during the next 13 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost represents 13.9% of payroll, decreasing to 13.0% for FY 2010, decreasing to 11.4% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of about 3.0% thereafter. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

**Appropriation Forecast**

Fiscal Year Ending	Employee Payroll*	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % Payroll	Funded Ratio %**
2009	\$22,402,987	\$1,819,080	\$1,097,306	\$2,021,908	\$3,119,214	13.9	77.2
2010	\$23,411,121	\$1,930,266	\$1,115,938	\$1,917,191	\$3,033,129	13.0	78.9
2011	\$24,464,622	\$2,047,776	\$1,134,025	\$2,003,464	\$3,137,489	12.8	80.5
2012	\$25,565,530	\$2,171,953	\$1,151,479	\$2,093,620	\$3,245,099	12.7	82.0
2013	\$26,715,979	\$2,303,159	\$1,168,209	\$2,187,833	\$3,356,042	12.6	83.6
2014	\$27,918,198	\$2,441,775	\$1,184,112	\$2,286,286	\$3,470,398	12.4	85.2
2015	\$29,174,517	\$2,588,202	\$1,199,080	\$2,389,169	\$3,588,249	12.3	86.7
2016	\$30,487,370	\$2,742,864	\$1,212,998	\$2,496,681	\$3,709,679	12.2	88.3
2017	\$31,859,302	\$2,906,204	\$1,225,741	\$2,609,032	\$3,834,773	12.0	89.9
2018	\$33,292,970	\$3,078,690	\$1,237,174	\$2,726,438	\$3,963,612	11.9	91.5
2019	\$34,791,154	\$3,260,815	\$1,247,154	\$2,849,128	\$4,096,282	11.8	93.1
2020	\$36,356,756	\$3,453,097	\$1,255,527	\$2,977,339	\$4,232,866	11.6	94.8
2021	\$37,992,810	\$3,656,081	\$1,262,127	\$3,111,319	\$4,373,446	11.5	96.5
2022	\$39,702,486	\$3,870,342	\$1,266,780	\$3,251,328	\$4,518,108	11.4	98.2
2023	\$41,489,098	\$4,096,482	\$1,269,295	\$0	\$1,269,295	3.1	100.0
2024	\$43,356,107	\$4,335,137	\$1,269,472	\$0	\$1,269,472	2.9	100.0
2025	\$45,307,132	\$4,586,976	\$1,267,094	\$0	\$1,267,094	2.8	100.0
2026	\$47,345,953	\$4,852,702	\$1,261,932	\$0	\$1,261,932	2.7	100.0
2027	\$49,476,521	\$5,133,054	\$1,253,739	\$0	\$1,253,739	2.5	100.0
2028	\$51,702,965	\$5,428,811	\$1,242,253	\$0	\$1,242,253	2.4	100.0
2029	\$54,029,598	\$5,673,108	\$1,298,154	\$0	\$1,298,154	2.4	100.0
2030	\$56,460,930	\$5,928,398	\$1,356,571	\$0	\$1,356,571	2.4	100.0
2031	\$59,001,672	\$6,195,176	\$1,417,617	\$0	\$1,417,617	2.4	100.0
2032	\$61,656,747	\$6,473,958	\$1,481,409	\$0	\$1,481,409	2.4	100.0
2033	\$64,431,301	\$6,765,287	\$1,548,073	\$0	\$1,548,073	2.4	100.0
2034	\$67,330,709	\$7,069,724	\$1,617,736	\$0	\$1,617,736	2.4	100.0
2035	\$70,360,591	\$7,387,862	\$1,690,534	\$0	\$1,690,534	2.4	100.0
2036	\$73,526,818	\$7,720,316	\$1,766,608	\$0	\$1,766,608	2.4	100.0
2037	\$76,835,524	\$8,067,730	\$1,846,106	\$0	\$1,846,106	2.4	100.0
2038	\$80,293,123	\$8,430,778	\$1,929,180	\$0	\$1,929,180	2.4	100.0
2039	\$83,906,313	\$8,810,163	\$2,015,994	\$0	\$2,015,994	2.4	100.0
2040	\$87,682,098	\$9,206,620	\$2,106,713	\$0	\$2,106,713	2.4	100.0

\* Calendar basis

\*\* Beginning of Fiscal Year

**GASB Statements No. 25 and No. 27**

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GASB Statement No. 5, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP).

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies, and information about contributions, legally required reserves, and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to \$0. The required disclosure information is shown in Table VIII.

**Table VIII**

	<u>January 1, 2006</u>	<u>January 1, 2008</u>
(1) Actuarial Accrued Liability	\$75,979,303	\$85,256,692
(2) Actuarial Value of Assets	<u>54,147,807</u>	<u>65,665,411</u>
(3) Unfunded Actuarial Accrued Liability	21,831,496	19,591,281
(4) Funded Ratio (2)/(1)	71.3%	77.0%
(5) Covered Payroll	\$19,896,839	\$22,402,987
(6) UAAL as a percentage of payroll: (3)/(5)	109.7%	87.4%
(7) Annual Required Contribution (ARC)	\$2,270,000	\$3,119,214
(8) Net Pension Obligation	\$0	\$0

**PERAC Annual Statement**  
**APPENDIX PAGE 3**  
**ACTUARIAL VALUATION AND ASSUMPTIONS**

The most recent actuarial valuation of the System was prepared by Buck Consultants as of January 1, 2008.

The normal cost for employees on that date was:	\$1,819,080	8.1% of pay
The normal cost for the employer was:	946,660	4.2% of pay
The actuarial liability for active members was:		\$49,820,564
The actuarial liability for retired and inactive members was:		35,436,128
Total actuarial accrued liability:		85,256,692
System assets as of that date:		65,665,411
Unfunded actuarial accrued liability:		\$19,591,281
The ratio of system's assets to total actuarial liability was		77.0%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	8.5%
Rate of Salary Increase:	5.5%

**SCHEDULE OF FUNDING PROGRESS**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded Actuarial Accrued Liability (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a percent of Covered Payroll (b-a)/c
01/01/08	\$65,665,411	\$85,256,692	\$19,591,281	77.0%	\$22,402,987	87.4%
01/01/06	54,147,807	75,979,303	21,831,496	71.3%	19,896,839	109.7%
01/01/04	50,857,118	65,276,552	14,419,434	77.9%	17,995,844	80.1%
01/01/02	46,779,157	59,312,723	12,533,566	78.9%	16,773,825	74.7%
01/01/00	48,071,979	49,486,969	1,414,990	97.1%	14,064,649	10.1%
01/01/99	39,201,694	46,718,881	7,517,187	83.9%	13,196,123	57.0%
01/01/97	26,399,577	36,258,355	9,858,778	72.8%	11,635,681	84.7%

Attach Copy of Current Approved Funding Schedule



## **EXHIBITS**

## Age/Service Distribution with Salary as of January 1, 2008

Attained Age	Average Salary <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
20-24	27	0	0	0	0	0	0	0	0	27
	20,195	0	0	0	0	0	0	0	0	20,195
25-29	74	3	0	0	0	0	0	0	0	77
	28,723	37,842	0	0	0	0	0	0	0	29,079
30-34	21	20	2	0	0	0	0	0	0	43
	30,529	39,953	56,066	0	0	0	0	0	0	36,100
35-39	24	17	10	3	0	0	0	0	0	54
	24,809	36,310	53,286	60,724	0	0	0	0	0	35,699
40-44	40	18	9	10	5	0	0	0	0	82
	22,557	38,409	48,802	63,854	58,436	0	0	0	0	36,141
45-49	48	29	9	3	13	6	0	0	0	108
	17,998	29,001	41,491	57,469	50,773	67,973	0	0	0	30,728
50-54	39	26	13	5	9	10	1	2	0	105
	17,225	23,834	36,025	54,178	54,227	58,593	52,448	54,078	0	31,098
55-59	13	17	9	15	10	5	9	6	0	84
	27,962	26,850	46,802	53,018	61,708	65,621	51,133	69,458	0	45,935
60-64	7	3	6	5	13	5	6	3	1	49
	17,260	33,488	33,910	42,580	35,358	50,459	56,229	62,892	43,920	39,175
65-69	2	4	2	2	0	2	0	0	2	14
	14,738	40,800	48,401	37,475	0	74,505	0	0	69,606	46,618
70+	2	0	0	0	0	1	2	0	0	5
	13,975	0	0	0	0	37,459	47,499	0	0	32,081
Total Employees	297	137	60	43	50	29	18	11	3	648
Average Salary	23,189	32,132	44,124	54,584	50,340	60,712	52,501	64,871	61,044	34,573

## Retiree Distribution as of January 1, 2008

Attained Age	Number of Employees			Total Payments		
	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	0	0	0	0	0	0
45-49	1	0	1	2,648	0	2,648
50-54	2	1	3	59,981	17,395	77,376
55-59	6	3	9	218,501	23,520	242,022
60-64	15	9	24	624,320	110,665	734,985
65-69	7	11	18	172,816	182,913	355,729
70-74	9	17	26	228,689	274,767	503,456
75-79	19	27	46	384,161	268,867	653,028
80-84	10	19	29	249,468	183,551	433,019
85-89	6	19	25	123,040	163,509	286,549
90-94	3	5	8	36,376	30,543	66,919
95-99	0	2	2	0	19,105	19,105
Total	78	113	191	2,100,000	1,274,836	3,374,836
Average (Age/Payment)	72.4	77.1	75.2	26,923	11,282	17,669
Frequency Percent	40.8	59.2	100	62.2	37.8	100

## Disabled Retiree Distribution as of January 1, 2008

Attained Age	Number of Employees			Total Payments		
	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	1	1	0	20,048	20,048
35-39	1	0	1	37,016	0	37,016
40-44	0	0	0	0	0	0
45-49	0	0	0	0	0	0
50-54	5	1	6	167,302	8,809	176,111
55-59	3	0	3	96,243	0	96,243
60-64	8	0	8	197,850	0	197,850
65-69	3	0	3	79,448	0	79,448
70-74	3	0	3	76,234	0	76,234
75-79	1	0	1	20,986	0	20,986
80-84	3	0	3	66,463	0	66,463
85-89	1	0	1	25,144	0	25,144
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	28	2	30	766,686	28,857	795,543
Average (Age/Payment)	64.3	42.3	62.8	27,382	14,428	26,518
Frequency Percent	93.3	6.7	100	96.4	3.6	100

**EXHIBIT 4 - CASHFLOW FORECAST:**

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

Plan Year Ending	Benefit Payments	Employee Contributions	Employer Contributions	Investment Returns	Net change in plan assets
2008	\$4,667,471	\$1,819,080	\$3,119,214	\$5,380,428	\$5,651,250
2009	5,101,057	1,930,266	3,033,129	6,019,754	5,882,092
2010	5,432,897	2,047,776	3,137,489	6,514,407	6,266,776
2011	5,810,261	2,171,953	3,245,099	7,040,312	6,647,104
2012	6,227,817	2,303,159	3,356,042	7,597,343	7,028,727
2013	6,656,127	2,441,775	3,470,398	8,186,860	7,442,906
2014	7,092,999	2,588,202	3,588,249	8,811,750	7,895,201
2015	7,526,672	2,742,864	3,709,679	9,475,766	8,401,637
2016	7,935,988	2,906,204	3,834,773	10,184,419	8,989,408
2017	8,424,043	3,078,690	3,963,612	10,940,363	9,558,622
2018	8,888,522	3,260,815	4,096,282	11,746,309	10,214,884
2019	9,378,611	3,453,097	4,232,866	12,607,642	10,914,994
2020	9,895,722	3,656,081	4,373,446	13,528,066	11,661,871
2021	10,441,346	3,870,342	4,518,108	14,511,528	12,458,632
2022	11,017,053	4,096,482	1,269,295	15,445,157	9,793,880
2023	11,624,504	4,335,137	1,269,472	16,263,596	10,243,701
2024	12,265,448	4,586,976	1,267,094	17,119,500	10,708,122
2025	12,941,732	4,852,702	1,261,932	18,014,066	11,186,969
2026	13,655,304	5,133,054	1,253,739	18,948,475	11,679,965
2027	14,408,220	5,428,811	1,242,253	19,923,881	12,186,725
2028	15,202,651	5,673,108	1,298,154	20,938,128	12,706,739
2029	16,040,884	5,928,398	1,356,571	21,995,267	13,239,352
2030	16,925,335	6,195,176	1,417,617	23,096,291	13,783,750
2031	17,858,552	6,473,958	1,481,409	24,242,123	14,338,938
2032	18,843,225	6,765,287	1,548,073	25,433,591	14,903,726
2033	19,882,189	7,069,724	1,617,736	26,671,420	15,476,691
2034	20,978,439	7,387,862	1,690,534	27,956,208	16,056,165
2035	22,135,134	7,720,316	1,766,608	29,288,406	16,640,196
2036	23,355,606	8,067,730	1,846,106	30,668,292	17,226,522
2037	24,139,504	8,430,778	1,929,180	32,116,925	18,337,379

amounts in thousands

## **EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:**

This summary is prepared in accordance with Chapter 32 as of January 1, 2008, and does not take into account any subsequent changes.

### **1. Administration**

Each of the 107 contributory retirement systems for public employees for the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

### **2. Participation**

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

- (i) Group 1: Most general employees in State and local government
- (ii) Group 2: Certain specified hazardous duty positions
- (iii) Group 3: State police officers and inspectors
- (iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

### 3. **Salary**

Salary is defined as gross regular compensation. Salary does not include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

### 4. **Member Contributions**

Member contributions vary depending upon date hired as follows:

<b><u>Date of Hire</u></b>	<b><u>Member Contribution Rate</u></b>
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later plus	9.0% of Salary
1979 and Later	2.0% of Salary in excess of \$30,000

### 5. **Average Salary**

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.)

### 6. **Creditable Service**

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

## **7. Service Retirement**

### **a. Eligibility:**

For an employee to be eligible for service retirement (also referred to as superannuation), one of the following conditions must be met:

- (i) completion of 20 years of service
- (ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member
- (iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service
- (iv) if an employee is a State Police officer (Group 3), attainment of age 50



b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table:

<u>Age at Retirement</u>	<u>Percentage of Average Salary</u>		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
65 or Over	.025	.025	.025
64	.024	.025	.025
63	.023	.025	.025
62	.022	.025	.025
61	.021	.025	.025
60	.020	.025	.025
59	.019	.024	.025
58	.018	.023	.025
57	.017	.022	.025
56	.016	.021	.025
55	.015	.020	.025
54	.014	.014	.024
53	.013	.013	.023
52	.012	.012	.022
51	.011	.011	.021
50	.010	.010	.020
49	.009	.009	.019
48	.008	.008	.018
47	.007	.007	.017
46	.006	.006	.016
45	.005	.005	.015
44	.004	.004	.004
43	.003	.003	.003
42	.002	.002	.002
41	.001	.001	.001

For Group 3 (State Police), the benefit is 50% of the participant's final year's rate of regular salary, plus an additional 1% for each year of service in excess of 20 years. In addition, for veterans (all groups) there is an additional benefit of \$15 per year for each year of service, up to a maximum of 20 years of service.

## **8. Deferred Vested Retirement**

### **a. Eligibility:**

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years.

### **b. Benefit Amount:**

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

### **c. Refund of Contributions:**

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

## **9. Accidental Disability**

### **a. Eligibility:**

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

### **b. Benefit Amount:**

The accidental disability amount is 72% of annual salary plus \$450 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

**10. Ordinary Disability****a. Eligibility:**

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55).

**b. Benefit Amount:**

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55, he will receive not less than the superannuation allowance to which he is entitled.

**11. Survivor Benefits****a. Occupational Death:**

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

**b. Non-Occupational Death:**

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of \$250 per month to the surviving spouse, plus \$120 for the first child, plus \$90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of \$250 per month plus \$120 for the first child and \$90 for each additional child.

c. Refund of Contributions:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

**12. Cost-of-Living Increases**

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$12,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

**13. Postretirement Death Benefits**

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

- (i) Option A – Life annuity
- (ii) Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member
- (iii) Option C – Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

## **EXHIBIT 6 – ACTUARIAL METHODS AND ASSUMPTIONS:**

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

### **1. Member Data**

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

### **2. Valuation Date**

January 1, 2008.

### **3. Actuarial Cost Method**

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

### **4. Rate of Investment Return**

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.5% per annum.

### **5. Salary Scale**

It is assumed that salaries including longevity will increase at a rate of 5.5% per year.

### **6. Cost-of-Living Increases**

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and \$12,000 per year.

### **7. Value of Investments**

Assets held by the fund are valued at market value as reported by the Public Employees'

Retirement Administration Commission (PERAC). The actuarial value of assets is determined using a five-year smoothing of unrealized gains and losses.

**8. Annual Rate of Withdrawal Prior to Retirement**

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

<u>Service</u>	<u>General Employees</u>	<u>Police and Fire Employees</u>
0	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

**9. Annual Rate of Mortality**

It is assumed that both pre-retirement and post retirement mortality are represented by the RP-2000 Mortality Table for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members.

**10. Service Retirement**

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

<b><u>Age</u></b>	<b><u>Male General Employees</u></b>	<b><u>Female General Employees</u></b>	<b><u>Male and Female Police and Fire Employees</u></b>
50	0.0100	0.0150	0.02000
51	0.0100	0.0150	0.02000
52	0.0100	0.0200	0.02000
53	0.0100	0.0250	0.05000
54	0.0200	0.0250	0.07500
55	0.0200	0.0550	0.15000
56	0.0250	0.0650	0.10000
57	0.0250	0.0650	0.10000
58	0.0500	0.0650	0.10000
59	0.0650	0.0650	0.15000
60	0.1200	0.0500	0.20000
61	0.2000	0.1300	0.20000
62	0.3000	0.1500	0.25000
63	0.2500	0.1250	0.25000
64	0.2200	0.1800	0.30000
65	0.4000	0.1500	1.00000
66	0.2500	0.2000	1.00000
67	0.2500	0.2000	1.00000
68	0.3000	0.2500	1.00000
69	0.3000	0.2000	1.00000
70	1.0000	1.0000	1.00000

**11. Annual Rate of Disability Prior to Retirement**

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

<b><u>Attained Age</u></b>	<b><u>General Employees</u></b>	<b><u>Police and Fire Employees</u></b>
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

**12. Family Composition**

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

**13. Administrative Expenses**

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 2008 is \$100,000 and is anticipated to increase at 4.5% per year.



## EXHIBIT 7 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

### 1. **Actuarial Accrued Liability**

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

### 2. **Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

### 3. **Actuarial Cost Method**

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

### 4. **Actuarial Present Value**

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

### 5. **Forecast**

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

**6. Normal Cost**

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

**7. Unfunded Actuarial Accrued Liability**

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

**8. Valuation Method**

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

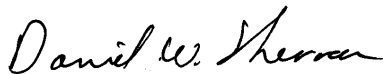
**9. Vested Liability**

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

## **CERTIFICATION:**

This report fairly represents the actuarial position of the Town of Shrewsbury Retirement System contributing as of January 1, 2008, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost is reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience.

Buck Consultants, LLC



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Daniel W. Sherman, ASA, MAAA  
Enrolled Actuary No. 08-4086

May 2008

## **BREAKOUTS**

## Breakouts

	<u>Total</u>	<u>All Others</u>	<u>Housing</u>	<u>Light</u>	<u>Cable</u>	<u>Water</u>	<u>Sewer</u>	<u>Custodians</u>	<u>School Employees</u>
(1) Participants									
(a) Actives	648	186	9	38	23	10	5	28	349
(b) Inactives	112	20	1	6	8	2	1	2	72
(c) Retirees and Beneficiaries	191	101	3	19	2	9	2	18	37
(d) Disabled Retirees	<u>30</u>	<u>23</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>2</u>	<u>2</u>
(e) Total	981	330	13	65	33	22	8	50	460
(2) Payroll of Active Participants	\$22,402,987	\$9,269,957	\$396,866	\$2,395,773	\$1,202,162	\$444,457	\$254,000	\$1,161,047	\$7,278,725
(3) Normal Cost									
(a) Total Normal Cost	2,765,740	1,249,557	36,807	304,235	136,824	43,550	23,473	134,234	837,060
(b) Expected Employee Contributions	1,819,080	754,768	29,429	178,914	105,027	35,323	20,650	95,012	599,957
(c) Administrative Expenses	<u>100,000</u>	<u>45,180</u>	<u>1,331</u>	<u>11,000</u>	<u>4,947</u>	<u>1,575</u>	<u>849</u>	<u>4,853</u>	<u>30,265</u>
(d) Net Employer Normal Cost (a) - (b) + (c)	1,046,660	539,969	8,709	136,321	36,744	9,802	3,672	44,075	267,368
(4) Actuarial Accrued Liability	85,256,692	49,530,643	1,519,882	13,799,544	1,962,751	2,353,881	945,214	5,369,825	9,774,951
(5) Assets*	<u>65,665,411</u>	<u>37,314,174</u>	<u>1,121,534</u>	<u>12,015,796</u>	<u>1,604,010</u>	<u>1,736,950</u>	<u>697,482</u>	<u>3,962,442</u>	<u>7,213,023</u>
(6) Unfunded Actuarial Accrued Liability (4) - (5)	19,591,281	12,216,469	398,348	1,783,748	358,741	616,931	247,732	1,407,384	2,561,928
(7) Amortizations*	1,766,057	1,101,255	35,909	160,796	32,339	55,613	22,332	126,869	230,945
(8) Total Required Employer Contributions (3d) + (7)	2,812,717	1,641,223	44,618	297,117	69,083	65,415	26,004	170,944	498,314
(9) Fiscal 2010 Cost	3,033,129	1,770,425	49,794	318,336	74,016	70,565	28,051	184,401	537,542
(10) Fiscal 2011 Cost	3,137,489	1,831,339	51,508	329,289	76,563	72,992	29,016	190,746	556,037
(11) Fiscal 2012 Cost	3,245,099	1,894,150	53,274	340,583	79,189	75,496	30,011	197,288	575,108
(12) Percentage of Total Cost	100.0%	58.4%	1.6%	10.5%	2.4%	2.3%	0.9%	6.1%	17.7%
(13) Funded Ratio	77.02%	75.34%	73.79%	87.07%	81.72%	73.79%	73.79%	73.79%	73.79%

\* Allocation is based on the ratio of the Unfunded Actuarial Accrued Liability